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In This Issue

W. O. Brewer, F. A. I. C.

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Ruth Johnstin

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John Helfrich, F. A. I. C.

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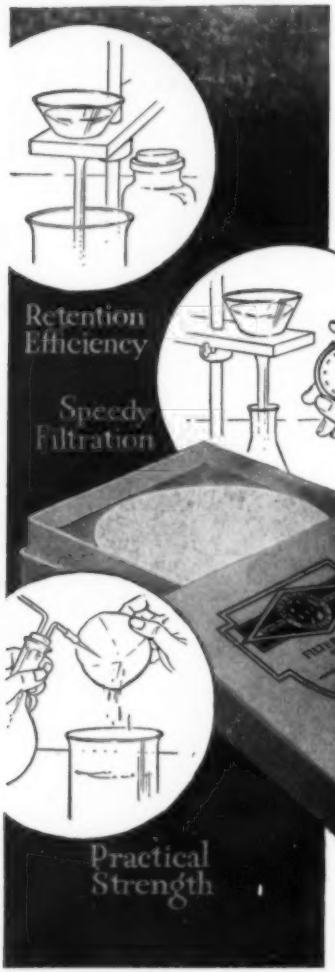

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The CHEMIST

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ALAN PORTER LEE, F.A.I.C., *Editor*, 233 Broadway, New York City

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A Friend of the Chemist

By W. O. Brewer, F.A.I.C.

The story of our President's career in chemistry and his early work for the Institute.

IN THE spring of 1911, during college recess, I was visiting the men of a local fraternity at Brown University to report to my chapter of Sigma Nu on their petition for membership. In the course of the day they took me to the chemical laboratories to meet an alumnus who was completing his graduate work coincident with holding an instructing position. I still remember my impression of this man's personality, his sincerity, strength of character, and active mind. Now after close association with Dr. Crossley for many years these characteristics are still outstanding.

It seems that M. L. Crossley matriculated at Brown University in the fall of 1904 with the determination to elect a premedical course. Within six weeks the sudden death of his father forced a temporary abandonment of his studies. He left college and found employment in the office of the Builders Iron Foundry. There in a period of two years he was able to accumulate a reserve so that he could again start his university studies in the fall of 1906.

As time was an important factor he determined to make up the two lost years by registering as a special student. Thus he could increase his course from the regular one offered, by some fifty per cent. He could also select those studies most essential to the fulfilment of his aims. During this year, besides this burden, Crossley continued with some of his outside office work and taught night school in Pawtucket. This conscientious effort attracted the attention and friendship of Professor Appleton of the department of chemistry, who made it pos-

sible for the student to use the laboratory the following summer to accumulate more points for his degree.

The successful accomplishment of this first year's schedule inspired Crossley to further extend his courses and the second year to double the prescribed hours. He was permitted by the Dean to carry this schedule on condition that he did creditable work in all courses. The necessity for remunerative work had not, in the meantime, become any less urgent. But somehow time was found to complete the courses satisfactorily. Another summer of laboratory work made graduation possible at the end of one more year with the class of 1909.

HIS interests were not confined to science alone. Although scientific courses were included in the fundamental training, they were augmented as far as time permitted by languages, public speaking, economics, history, educational and social sciences, philosophy, and psychology. He was anxious that his education be broad enough to enable him to appreciate art, music, literature, and philosophy. This he felt would prepare him so to interpret the facts of science that he might enjoy his work and be a useful citizen. The foundation needed, he felt, was best built on scientific and cultural studies. His minor for the Ph.D. was superimposed upon all the undergraduate courses in biology. The graduate work included chemical physiology, anatomy, investigation of the rudimentary voice mechanism in the alligator, and the relation of creatinine to body metabolism.

During these three years the contact and association with Professor Appleton had materially heightened Crossley's interest in chemical research and in teaching. This had an important bearing on his decision to abandon the idea of studying medicine, and to prepare himself to teach various phases of organic chemistry intimately related to medicine.

Perhaps it was also the fascination and appeal to imagination which held his interest in the chemistry of aromatic compounds. We know that those who deal with these have a wide range in which to exercise their imagination. Starting with a bare structure they add a group here, they substitute, combine, and rearrange to mould their molecule to their ideal. Today one has only to sit with Dr. Crossley and watch him weave the patterns on paper through a labyrinth of formulae to appreciate how deep is his interest. A confidence is also born in his listener that he knows the means, the right chemical tools, with which to fashion each step.

ACCEPTING a position as an instructor, the graduate continued his studies two more years at Brown. He was rewarded with his Master's degree and election to Sigma Xi in 1910 and with his Ph.D. in 1911. He had thus completed the usual seven-year course in five years. He had done it with scholastic honors and earned the money to finance his education.

The local society, mentioned before, had been organized as a debating society by Dr. Crossley during his first year. The small group of members included chiefly men of high scholarship. It soon took the form of a secret society and was accepted as such by the University faculty under the name of Sigma Delta Kappa. Soon after Dr. Crossley left Providence, Sigma Delta Kappa became the Delta Lambda chapter of Sigma Nu. He was initiated on his return the following June. Later, while teaching at Wesleyan University at Middletown, he helped to organize a group of students which petitioned for a charter from Sigma Nu and was admitted before he left Middletown.

The first two years after receiving the doctor's degree, Dr. Crossley was associate professor at William Jewel College. There he taught organic chemistry, general physiology, and comparative anatomy. During the intervening summers he returned to Providence where he carried on laboratory research with Professor Appleton. As he was about to return for his third year at William Jewel he received word that their chemical laboratory had burned down. Almost simultaneously came an offer to become a lecturer in chemistry at Wesleyan University. The next year he became associate professor and acting head of the department, which position he held until 1918. Research occupied a great deal of his time. In addition to fundamental research, he was interested in industrial research. During 1915 to 1918 he was a consultant for the Barrett Company.

In those years when the industry in this country was for the first time making a myriad of new and complex compounds, the path of the chemist was difficult. Reactions in mass did not always proceed as in the laboratory. Proper tools were not available to withstand the chemical and mechanical actions. Sales requirements limited time for investigation. In such a situation, Dr. Crossley's intimate knowledge of synthetic organic chemistry found practical application through his acceptance of the position of chief chemist for the Calco Chemical Company. There he helped to improve the yields and quality and to establish the controls which made these consistent. He devised process changes to reduce losses of time and materials. In the laboratory he directed the working out of accurate methods of analysis for control

purposes or to permit research to proceed to a successful conclusion and established the basis of new syntheses. The operating departments found him an aid in time of trouble; the chemists, a sympathetic friend and helpful director. In the incessant routine of almost daily meetings of technical and managerial staff, Dr. Crossley could be depended upon to bring well-developed reports, clear opinions, and recommendations. These were backed up by constructive reasons and an ability to defend them. As chief chemist and member of the various committees, technical, pharmaceutical, dye, and research, for 14 years he has made material contribution to the company he serves.

WHILE there are some half dozen publications on anthraquinones covering researches carried out in his teaching days, for obvious reasons there are no public records of the research accomplishments of this man in industry. However, Dr. Crossley has written on general subjects dealing with the field of organic chemistry under such titles as:

The Chemistry of Intermediates, *J. Ind. & Eng. Chem.*, 14, 802
Colors That Please, *Am. Druggist*, 70, 20
Color and Constitution, *Ind. Eng. Chem.*, 16, 271
The Chemical Rainbow, *Chem. in Ind.*, 2, chap. 4
Aniline, *Chem. Markets*, Sept., 1926
Ten Years of Progress in the Dye and Intermediate Industry, *Ind. Eng. Chem.*, 18, 1922
Intermediates—Half Century of Progress, *Textile Col.*, Dec., 1928
The Contribution of Aniline to Economic and Social Progress during the Past One Hundred Years, *Jour. Chem. Ed.*, 4, 338

A number of patents have been granted to Dr. Crossley on the synthesis of dyes, intermediates, pharmaceuticals, mordants, and on the synergism of drugs. These are assigned to the Calco Chemical Company.

It is indeed fortunate for the profession of chemistry that a group of men including the subject of this sketch became interested in the possibilities for constructive action of the then little-known American Institute of Chemists. While this organization had as its object the betterment of the chemist, its method of functioning did not seem to be along the most desirable lines. These men felt strongly that the potential value of the Institute would be improved by the establishment of a better standard of chemical services together with education of the employer and the public to an adequate appreciation of

properly trained chemists. Their program was initiated by the election of Dr. Crossley to the presidency of the Institute in 1924. At that time he was just completing a trip abroad in the interest of Calco and immediately on his return vigorously entered into the task of building up a strong organization, establishing definite objects, and aiding the effort to gain the cooperation of the American Chemical Society.

In his first presidential address he formulated the objects of the Institute. These objects were adopted practically intact as a part of the new constitution. His unceasing efforts were largely instrumental in laying a strong foundation for the Institute. One important contribution to the stability and growth of the Institute was his influencing of prominent chemists to join and take an active part in the work for the success of the organization. In his efforts to create interest on the part of the profession at large, Dr. Crossley published such papers as:

The A. I. C.—Its Scope and Methods.
The Past and Future of the A. I. C.
Qualifications of Organic Chemists.
What Is a Chemist?
Training for the Profession of Chemistry.

WITH the completion of his term as president, Dr. Crossley's service to the profession of chemistry had only just begun. It formed a background for continued and helpful endeavor as a member of the advisory council of the Institute ever since. All this time he has been drawing on his experience first as a teacher and later as a director of the chemist in the industrial field, to formulate a practical picture of what a chemist should know to make his services the most effective. Early it was agreed by the Institute that its members should be so chosen that their education entitled them to be called chemists. This standard was a four-year course resulting in a bachelor's degree in chemistry. Dr. Crossley soon recommended raising this to a minimum of six years of study. Inquiry among the universities confirmed this opinion. The Institute in 1931 voted to raise the requirement of membership to this. However, realizing the importance of years of experience in this field, the older men in the profession were permitted admittance to membership under a rule which may accept their experience in lieu of the extra two years. It was pointed out by Dr. Crossley that, while the fundamental training for the profession of chemistry is generally best secured through formal courses of instruction,

"no barrier should be raised to prevent anyone from obtaining the equivalent knowledge, if possible, by other means." He argues that "the main concern of the profession must always be to insure competent service in the solution of chemical problems and in the interpretation of the facts of chemistry so as to advance our civilization." He defines a chemist as a person who is "qualified by education and experience to ascertain the facts of chemistry and interpret them so as to benefit humanity and accelerate progress."

Dr. Crossley has consistently maintained that the fundamental courses in languages, mathematics, economics, humanities, and other sciences are essential if chemists are to be properly trained to render maximum service and that these cannot be obtained in four years.

As chairman of the Institute's committee on professional education, he studied the situation thoroughly and prepared a detailed report outlining the courses which he believes essential for this training. The committee passed this report and it was published in THE CHEMIST in June, 1931. Copies were sent to 568 universities and colleges which offer courses in chemistry, asking for their comments. Their interest and general agreement to these recommendations is evidenced by over 100 replies. This report may have far-reaching consequences in the establishment of a standard curriculum and one which ensures a more comprehensive and effective chemical education.

Dr. Crossley is active also in other organizations. He has always been active in the American Chemical Society. He was chairman of the Connecticut Valley Section from 1915 to 1917. In 1926 he became chairman of the Dye Section of the A. C. S. and vice-president of the Society. In the same year he was delegate to the International Union of Pure and Applied Science. He is a member of the Society of Chemical Industry (London), a fellow of the American Association for the Advancement of Science, a member of the board of directors of the American Institute of the City of New York, and an interested member of The Chemists' Club.

Winter recreation time is absorbed largely by our friend in the study of research reports, chemical publications and those in other fields of science. His efforts in behalf of the Institute, and of its members, take up the major portion of his time off duty. On summer evenings he may be found on the golf course. Week-ends are planned when possible, as well as vacation, at his summer home at Martha's Vineyard. There sailing with his son, Evan, becomes his chief interest.

Chemistry at Wellesley

By Ruth Johnstin

The important position of the study of chemistry at a leading women's college.

THE sciences have always maintained a prominent place in the curriculum of Wellesley College because of the wisdom and vision of its founder, Mr. Henry Fowle Durant, and the cooperation of succeeding administrations. Mr. Durant was firmly convinced that young women should have educational opportunities equivalent to those provided for young men and in 1873 he began the courageous task of founding a college, financed from his private fortune, which should meet such a need. His ideals were conveyed in the foreword of the first catalog issued in 1874 in which he said that the college was to be "equipped for collegiate methods of instruction and for courses of difficult study such as are pursued in none but the best colleges." It was "intended for those students only who desire to give themselves faithfully to the pursuit of knowledge and to the development of their minds by arduous study."

Although it was a radical departure from the prevailing ideas of his time, Mr. Durant believed firmly in the necessity for laboratory instruction in the natural sciences. When Wellesley College opened in September, 1875, there was a well-equipped laboratory for the study of chemistry, a subject which the founder regarded as fundamental for all science work. Edward Abbott, describing the college in 1876 (*Harper's Monthly Magazine*, 53, 321, 1876) said, "there are many things about the methods of study at Wellesley which are new and interesting—the instruction in chemistry is confined almost exclusively to actual work in the laboratory. This is fitted up with every convenience for a class of ninety-six students, each with her own drawer and cupboard." At the start, general chemistry was required of all Sophomores, and there were elective courses for Juniors in qualitative and volumetric analysis and theoretical chemistry, and for Seniors there were courses in gravimetric analysis and organic chemistry.

In the formulation of his plans for scientific work at Wellesley, Mr. Durant had the able assistance of his friend, Doctor E. N. Horsford of Harvard College. As president of the board of visitors, Professor Horsford was in close touch with all phases of the college life for almost

twenty years. At the present time, the income from the Horsford Fund makes possible the purchase of books and special equipment for all of the science departments of the college.

ALTHOUGH the sciences, especially chemistry, were thought by many of the early educators not to be suitable studies for young women, these subjects became increasingly popular at Wellesley. Two years after the college opened, a change was made in the curriculum, whereby two separate courses were offered, the classical and the scientific. The latter course, planned primarily for those who wished to become teachers of a science, permitted the student to work for Honors in the subject and required a reading knowledge of French and German for admission. Courses were adapted to the special needs and interests of the students and every effort was made to give thorough training in the chosen subject.

The similarity between these and some of the modern educational policies is worthy of comment. Concentration in a Field and Honors in Courses which are names for some of the present-day plans for vitalizing the work of able students, appear to embody the same educational theories as were advanced by the founder of Wellesley College over fifty years ago.

In the latter part of the nineteenth century, one of the greatest difficulties encountered in the carrying out of a program for the higher education of women was the scarcity of adequately trained women instructors. This was particularly true in the field of chemistry, since it was only in the best of the men's colleges, practically none of which admitted women, that such training could be obtained. Fortunately for the future of the chemistry department of Wellesley, the work was started under the direction of Miss Maria S. Eaton, a woman of advanced scholarship and high ideals. One of the first students who came under her influence was Charlotte F. Roberts who graduated in the class of 1880. In September of that year, Miss Roberts returned to the college and began her association with the work of the department, first as curator, then instructor, and finally as professor of chemistry. Her death, in 1917, came at the end of thirty-seven years of almost continuous service. When Miss Roberts was granted the degree of Doctor of Philosophy by Yale University in 1894, she was one of the few women in this country who had attained such distinction in the field of chemistry.

During these early years the names of other well-known chemists may be found in the lists of the Wellesley College faculty, such as Ellen H. Richards, Henry P. Talbot, and Augustus H. Gill. Special mention

should be made of Miss Charlotte A. Bragg, whose teaching of general chemistry during the forty years of her connection with the department (1890–1930) was an inspiration to many students.

ADEQUATE supervision, especially of the laboratory work, has always been considered an essential part of the teaching of chemistry at Wellesley. While every effort is made to encourage independence in the advanced students, it is believed that the foundations are best laid by giving the beginning students as much individual instruction as possible. As a rule there are no more than twelve students assigned to one instructor in the laboratory. There are now eight members of the teaching staff with the total registration of students in all courses slightly over two hundred.

Since a multiplicity of courses requires an undue expenditure of time for the instructors and a dissipation of appropriation for equipment, the number of different chemistry courses offered has never been large. There is, however, adequate provision for such courses as are necessary for a good foundation in the fundamental principles of chemistry and in the development of correct laboratory technique. At the same time, such specialized courses are given as will prepare the student for graduate study and research or for work in some gainful occupation. In our experience, the introduction of courses such as "Chemistry Applied to Daily Life" has never met with much success. Our students who elect the study of chemistry frequently do so with serious intentions of majoring in the subject, and for them, an informational course is more or less a waste of time.

Neither have we ever thought it advisable or necessary to make concessions because our classes are composed entirely of women. Since there can be only one standard of excellence in this kind of work, the wisdom of this policy is demonstrated when we examine the records of our students who enter the graduate schools. In the colleges of medicine, as research workers and as hospital technicians our students have been able to compete most creditably with the men.

The courses, as now given at Wellesley, are not essentially different from those of a number of similar institutions. For those who enter without chemistry there is a year of general chemistry, while those who present this subject for admission are placed in a more advanced course for one semester, this being followed by qualitative analysis the second semester. For those who major in the subject, general chemistry, qualitative and quantitative analysis, and organic chemistry are essential. Any other course in the department may be added to complete

the twelve-year-hour major. All students are advised to take physical chemistry.

It might be of interest to mention one or two of the changes in our curriculum which we now believe have been effective in raising the standard of the work of the students majoring in this department. Five years ago the faculty recommended the adoption of the plan of a general examination for all candidates for the Bachelor of Art degree. This examination is given at the end of the senior year and covers the work of all courses counting toward a major in the student's chosen subject. The thorough review, which such an examination requires, gives an opportunity to organize and condense material and to get a better grasp of the fundamental and coordinating principles of the various branches of the subject. This is particularly true in the field of chemistry where the sequence of courses is so marked.

If the student has done outstanding work in the first two or three years and prefers to do so, she may, with the permission of the department, omit the general examination and work for Honors in Subjects. This means that the student will do intensive work in chemistry and another closely related science. In the senior year she will be relieved from an equivalent amount of class work and is allowed to proceed independently under the direction of the instructor in charge. Her knowledge of her chosen field is tested at the end by an examination which is in part or wholly oral. There is required also, a written report of the work on her special problem.

One other innovation which has proved to be stimulating to better scholarship is a course called Directed Study. If a student does not wish to work for Honors in Subjects but still has a desire to do some independent work along the line of her special interest, she may, with permission, substitute three hours of Directed Study for one course, and then spend her time in work on a problem under the direction of an instructor.

A careful study has been made of the requirements for admission to the best medical schools in an effort to insure adequate preparation for our graduates who plan to study medicine. In addition to the usual requirement of six semester hours each of general, analytical, and organic chemistry, such students are advised to take at least three semester hours of physical chemistry. It is contrary to our policy to recommend that pre-medical students take more than the required undergraduate courses in chemistry. In fact, they are strongly urged to elect non-scientific subjects which are precluded because of the highly

specialized nature of the medical school, but which we feel are very necessary for a broad foundation of such work.

Although the opportunities at Wellesley for advanced work in chemistry are limited because of the crowded condition of the laboratories, still we always have a few graduate students who are working for the Master's Degree. For a number of years it has been the custom to offer several graduate assistantships, which permit the student to devote part of her time to study and spend the remainder on the work of a laboratory assistant. This arrangement makes it possible to complete the work for the Master's Degree in two years and the remuneration is sufficient to cover practically all of the student's expenses. A reading knowledge of French and German and, in addition to nine hours of course work, a thesis reporting the results of original investigation are required of all candidates for this degree. Two major problems have been under investigation. For some years Professor French and her students have been working on the relation between absorption spectra and the structure of certain organic compounds, and Associate Professors Griggs and Johnstin are continuing their studies of various phases of the problem of the pectic substances.

Perhaps it might be better not to say anything about the building, but no account of the work of the chemistry department at Wellesley would be complete without some such statement. The laboratory, which was thought to be adequate when the college opened, soon proved to be too small and several more rooms were fitted up, which sufficed for about ten years. In her report to the Trustees in 1888, President Helen A. Shafer made an urgent appeal for additional rooms and equipment for the advanced work of the undergraduates, and for the research work of the members of the faculty. Similar requests during succeeding years finally resulted in the erection of a separate building for chemistry. This was completed in 1895. A wooden structure, intended for a temporary housing for this department when it was built thirty-seven years ago, it has the unique distinction of still being in use. Because of the active part which Wellesley College took in chemical war work, an organic chemistry laboratory was added in 1917, and five years ago we acquired a well-equipped quantitative laboratory and a balance room.

Now President Pendleton is again emphasizing the need for a building which will relieve the congestion of the laboratories and do away with the great fire hazard. Encouraged by the successful outcome from the appeals for aid on similar occasions in the past, we are now looking forward, with confidence, to the time when a modern, fire-proof building will enable us to carry on the work of the department more efficiently.

The Textile Chemist

By A. H. Grimshaw, F.A.I.C.

Professor of Textile Chemistry at N. C. State College

FOR several years the writer has tried to stress at meetings of various textile societies, the need of a chemist in textile operations. Naturally, a chemist trained along the lines of the textile industry would have an advantage over a chemist not so trained, but any trained chemist can be of value to a textile plant.

For instance, a year ago, a manufacturer called the writer in for consultation in regard to some troubles which were being found by his customers on material finished at his mercerizing plant. During the course of the investigation, it was discovered that the manufacturer did not have the services of a trained chemist. The first recommendation made was that he hire a chemist and he did this. Since that time, the chemist has made investigations and recommended methods to overcome faults, and the plant has saved much money in the purchasing department and also in the reduced amount of seconds. The salary of the chemist was saved many times over by his understanding of chemistry applied scientifically to mercerizing problems. Tremendous amounts of water are used by this manufacturer which necessitates control of the water supply. By analysis the chemist reduced the amount of lime being used at one time from 30 bags to 10. The amount of acid used in neutralizing the excess caustic was calculated to the proper amount and control was established.

Lately the need of trained chemists has been emphasized in the making, selling, and using of sulphonated oils so important to the textile industry. An Association of Sulphonated Oil Manufacturers has been formed to study methods of analyzing, grading, and naming products of this kind. The Bureau of Standards of the United States has also been working along these lines. The American Leather Chemists Association has specified methods of analysis for this compound. In December, 1931, the American Association of Textile Chemists and Dyers appointed a committee to work on methods of analysis of sulphonated oils. As there are so many different methods of analysis, all of the chemists connected with the above American organizations are cooperating to find simpler and uniform standard methods. As sulphonated oil is only one of the many compounds used in the manufacturing of textiles, the industry should offer opportunities for the employment of more chemists.

Chemistry as Applied to the Newspaper Industry

By John Helfrich, F.A.I.C.

Standardization of purchase specifications and control of printing operations have proven of value in production of daily journals.

IT WAS in the latter part of July, 1922, that Mr. William Randolph Hearst decided that his newspapers in New York should have a laboratory. This decision was prompted by the fact that the press rooms had experienced considerable trouble in obtaining printing results that were satisfactory to Mr. Hearst, and that the fault seemed to be due to an inferior grade of newsprint. To determine the cause of this fault, Mr. Hearst ordered that a laboratory be installed. It was obvious that no one in his organization knew very much about how this laboratory was to function or how to go about establishing it. It happened that I was acquainted with Mr. George Palmer of the Hearst newspapers and he, knowing that I was a chemist, approached me, stating that the job of installing a laboratory had been wished on him, and asked if I would accept the position as chemist. Mr. Hearst had given his order for the laboratory on Saturday and expected that by the following Friday the place would be fully equipped, manned with trained chemists, and ready for operation. So great was his faith in his associates that he sent copies of the *New York Evening Journal* to what he thought was the laboratory and asked an immediate report on the clay content of the newsprint. The results were sent to him as quickly as possible, but it must be evident that the determinations were not made in the Hearst laboratory. In a short time, adequate space was found for the laboratory. The necessary equipment was installed and supplies were obtained.

Although a laboratory was established, no one connected with the organization had any idea how it should function nor what was expected from it. In most cases the department heads were hostile to the idea, for they could not visualize how a chemical laboratory could be of assistance to them. Later they realized how they could benefit from

its services and became staunch supporters of the idea. I believe the fact that the laboratory functioned as a first aid in emergencies of manufacturing troubles, that it told the truth, and did not attempt to play organization politics, created the era of good feeling that has prevailed for many years. The value of a chemical laboratory to the Hearst newspapers became so apparent that in 1926 a laboratory was established in Chicago for the use of these newspapers in the Middle West.

AFTER the laboratory was established in New York, it was decided to cooperate with the Purchasing Department and the heads of the various departments to establish a set of standards for all supplies and materials used by the Hearst papers in New York. I am listing the materials used in the various departments, as I believe this will be of interest to the layman who may be surprised at the number of materials that find application to the newspaper industry.

Art and Photo-engraving:
- Hydroquinone, Metal, Hypo
- Potassium bromide
- Potassium iodide
- Sodium sulphide
- Sodium cyanide
- Sodium sulfate
- Sodium hydroxide
- Silver nitrate
- Ammonium bichromate
- Ammonium iodide
- Copper sulfate
- Ferrous sulfate
- Calcium chloride
- Cadmium iodide
- Iodine
- Shellac
- Ether
- Benzol
- Alcohol
- Nitric acid
- Strontium chloride
- Acetic acid
- Mercury bichloride
- Zinc and copper plates

Composing Room:
- Linotype metal
- Monotype metal
- Type washing compound
- Mineral lubricating oil
- Castor oil fluxes

Stereotyping Room:
- Stereotyping metal
- Dry matrices
- Lubricating oils

Press Room:
- Inks—News black; news black, toned; Magazine—black, red, yellow, blue
- Newsprint
- Adhesives
- Lubricants—Oils and grease
- Cutting rubbers
- Press packings and blankets

Circulation:
- Twines
- Wrappers
- Adhesives

Electrotyping:
- Copper anodes
- Copper sulfate
- Iron filings
- Wet lead
- Moulding lead
- Backing metal

Backing fluid
Ozokerite wax
Gum
Cleansers
Sulfuric acid

Garage:

Gasoline
Oils—greases
Body polishes

After the standards were established, examination of the materials were made at regular intervals to determine if the materials met with the specifications. Newsprint, inks, and type metals were examined every week. Samples were analyzed at frequent intervals at the request of the men in charge of the various departments.

THE activities of the laboratory were then extended to research and development work as applied to manufacturing processes and the development of new ideas. Particular attention was paid to control of the electrolytic baths in the electrotype shop and to developing new processes in photo-engraving. Until rubber rollers were universally adopted as part of the standard equipment of the black news-presses, the laboratory maintained a supervision over the composition roller department. A few of the problems that came to the attention of the laboratory were:

Photo-engraving Department:

The use of cold top enamel
The use of stripping films and developing baths
Silver nitrate baths' standardization
Dithmann Process of color separation
Electro-etching processes

Stereotype:

Proper drossing and cleaning of metal
Humidification of dry matrices
Facing pastes for dry matrices
Cause of shallow plates

Composing Room:

Proper drossing of linotype metal
Cause of broken slugs
Cause of clogging of mouth pieces on linotype machines
Composition of grey powder in metals
Proper fluxes for use in drossing metals
Composition of monotype metal
Elimination of zinc, arsenic, and copper from linotype metal

Press Room:

Elimination of grit from news ink
Cause of ink "misting"
Cause of collection of grit on "pipe" rollers
Cause of ink penetration and its elimination
Defective press blankets and top sheets
Defective rollers
Proper lubrication
Printing processes—Rotogravure, Offset, Planographic

Electrotyping:

Control of copper sulfate baths
Investigation of cause of imperfect shells
Indirect process for electrotyping

Newsprint:

- Basic ream weight investigation
- Bone dry ream weight investigation
- Relation of production figures to actual ream weight of paper delivered
- Wrapper weight and composition
- Estimation of gloss and its relation to good printing

Inks:

- Investigation as to cause of penetration
- Elimination of grit
- Relation of viscosity as to speed of press
- Estimation of tinctorial value of inks

IT is evident that the functions of a newspaper chemical laboratory are threefold:

1. Standardization of supplies and materials that find an application in the processes of manufacture, and checking shipments received to ascertain if they meet with the requirements of the specifications.
2. Control over processes—type metals and electrolytic baths
3. Investigation and development of new processes.

The U. S. Government Printing Office at Washington, D. C., maintains an excellently equipped and managed chemical laboratory. This office issues a report every year covering its various activities and it is interesting to know of the work of the testing laboratory. This laboratory's activities are very similar to those of the Hearst laboratory to a great extent, with the exception that the U. S. Government Printing Office does all kinds of printing and naturally its field of research and control is larger. During the past few years the American Newspaper Publishers' Association has become interested in the application of research to the industry. A mechanical research bureau has been established and a chemist, appointed by the A. N. P. A., is stationed at the chemical laboratory of the U. S. Government Printing Office. It seems to me that an organization such as the American Newspaper Publishers' Association should establish and endow its own chemical research laboratory and not make use of the services of a government laboratory.

With the proper spirit of cooperation and reasonable understanding, every large newspaper or printing establishment could intelligently use the service of a chemist. It may not be necessary to establish a laboratory at the plant, but the services of a local consulting or analytical chemist might be utilized advantageously. It is unfortunate that those whose function in life is to transmit intelligence, at times possess the capacity to resist it to a marked degree.

BOOK REVIEWS

VAN NOSTRAND'S CHEMICAL ANNUAL—SEVENTH ISSUE. By JOHN C. OLSEN, Editor. New York, 1934.

This seventh issue has 229 pages more than its predecessor, part of the increase being accounted for by fifty new tables, while the balance is to be found in an extended list of new books published since 1926. The writer, having used many previous editions of the annual, finds the current issue equally legible as regards type size, and improved in the opacity and handling quality of its paper. In both of these respects, as well as in its limitation of scope to data which are useful to chemists the writer believes it superior to most of the other chemical handbooks on the market.

Naturally, in a compilation of this size, it is inevitable that a few errors and inconsistencies creep in, despite the care which has very evidently been exercised in editing the volume. It should be noted, for example, that on Page 77 there is an error in the composition of the Clark & Lubs buffer solution for the alkaline range. It is also interesting that some of the newer solvents such as "Carbitol" and "Cellosolve" are listed in the table of Organic Compounds only by their trade names, while others, such as "Hexalin"—"Hexahydro-Phenol," are to be found listed only as "Cyclo-Hexanol." Despite minor blemishes, such as these, the addition of a considerable section on the calculation of gas combustion data, and the inclusion of all of the valuable tables present in the sixth issue, make the handbook one which is indispensable to every working chemist. K. M. H.

JÖNS JACOB BERZELIUS — AUTOBIOGRAPHICAL NOTES. Trans. by OLOF LARSELL. Pub. by *The Williams and Wilkins Co.*, Baltimore, Md.

To us, who have only to telephone the nearest supply house for any bit of equipment we need for our work, the story of the difficulties under which the pioneers in our science worked is always fascinating. When there is coupled with this story the human tale of poverty to overcome in early life and political machinations rising up at almost every turn, the complete picture emerges with double interest. Finally there is the knowledge that the writer of this absorbing history contributed largely to the very basis of chemistry. The total result is one which this reviewer has no hesitation in recommending even to confirmed readers of detective stories. K. M. H.

THE SYNTHETIC DYESTUFFS AND INTERMEDIATE PRODUCTS. By J. C. CAIN and J. F. THORPE. 7th Edition revised by J. F. Thorpe and R. P. Linstead. Pub. by *J. B. Lippincott Co.* Philadelphia, Pa.

No one who is acquainted with and has used the sixth edition of Cain and Thorpe will want to be without this new edition which has been entirely rewritten and considerably enlarged.

To those who may not previously have noticed this valuable text we would state that it consists of three sections:

Intermediate Products.

The Dyestuffs.

Preparations of Intermediates and Dyestuffs, and an appendix on the application, valuation, and analysis of dyestuffs.

Whether considered as a text for competent students of organic chemistry who wish to delve further into the special field of dyestuff chemistry or as a reference for those who need now and then a thorough explanation of a bit of this branch of applied science, this work serves its mission excellently. In particular, the chapters on the chemistry of the vat colors and the detail in the directions for the laboratory preparations are each worthy of special note.

As a whole, the book is one which will be found exceptionally useful and reliable by anyone having any contact with the dyestuff field.

K. M. H.

ADDRESSES WANTED

The office of the Secretary of the Institute desires to obtain the present addresses of the following members. Anyone able to assist the Secretary in this connection is requested to communicate with him at 233 Broadway, New York City.

Irvin Cole
formerly: 2331 Cambrelling Ave.
New York, N. Y.

Galen F. Hoffman
formerly: Juniata College
Huntingdon, Pa.

Henry N. Keife
formerly: Calco Chemical Co.
Bound Brook, N. J.

John H. Kuesel
formerly: Rock County Hospital
Orangeburg, N. Y.

Casimiro Liotta
formerly: 330 Weirfield St.
Brooklyn, N. Y.

Harold E. Moore
formerly: 2292 Indiana Avenue
Columbus, Ohio

Alvin W. Underkoffler
formerly: Juniata College
Huntingdon, Pa.

Nao Uyei
formerly: 3752 80th St.
Jackson Heights, N. Y.

Kenneth G. Watkins
William C. Watkins
formerly: 735 N. Tuxedo Avenue
Stockton, Calif.

INSTITUTE NOTES

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Calco Chemical Co.,
Bound Brook, N. J.

HOWARD S. NEIMAN, *Secretary*
233 Broadway
New York, N. Y.

ARTHUR J. HILL, *Vice-President*

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National Council

December Meeting

The one hundred and seventeenth meeting of the Council of The American Institute of Chemists was held at The Chemists' Club, 52 East 41st Street, New York, N. Y., on Thursday, December 20, 1934, at 6:30 o'clock, P. M.

President M. L. Crossley presided.

The following Councilors and Officers were present: Messrs. Crossley, Jackson, Knight, Neiman, Van Doren, Zons and Miss Wall.

The minutes of the previous meeting were approved. The report of the Treasurer, showing a cash balance of $1,215.37 and an excess of assets over current liabilities of $889.42, was accepted.

The report of the Committee on Membership was accepted and the Committee continued. The Committee on Emblems reported progress and the report was accepted. No report was received from the Committee on Institute representation at the New York meeting of the American Chemical Society. A report of the Committee on Chapter Medals for College Students was presented and accepted. The National Council adopted a suggested medal referred to as 521-a in the report; the back of the medal to carry the name of the recipient, the name of the university, and the date; the circle upon the front of the medal to carry the words "Award of The American Institute of Chemists, Inc.;" the center

of the front to carry the words, "For scholastic achievement." Upon motion made and seconded this committee was instructed to obtain dies of the medal, not to exceed a cost of $20.00. Upon motion made and seconded, the conditions of the award for college students were referred to the Committee on Professional Education.

The Secretary presented a letter from the Federation of Architects, Engineers, Chemists, and Technicians, requesting the Institute to appoint a representative to be present at the annual convention of the Federation, to be held in Chicago, and the Secretary was requested to advise the Federation that the Institute is not able to have an official representative present at that time.

The Secretary presented a letter of December 12, 1934, from W. R. Sassaman, Labor Advisory Board, National Recovery Administration, relative to certain suggested amendments relative to chemists now included in adopted codes, and upon motion made and seconded, the matter was referred to a special committee for its consideration. President Crossley appointed Dr. H. G. Knight, Dr. L. Van Doren, and Dr. F. W. Zons to this Committee.

The report of the Committee on Membership was considered and the plan suggested in such report was approved.

Upon motion made and seconded, the annual dues of Fellows were reduced from $10.00 to $5.00.

The following new members were elected:

FELLOW

RAYMOND ELLER KIRK, Head Department of Chemistry, Polytechnic Institute of Brooklyn, Brooklyn, N. Y.

ASSOCIATE

JOHN GODDARD WRIGHT, Research Assistant, The Geigy Company, 89–91 Barclay Street, New York, N. Y.

The Secretary reported on the present standing of the members of the Institute.

There being no further business, adjournment was taken.

Pennsylvania Chapter

On Saturday afternoon, November 3, 1934, the chapter made an inspection trip through the plants of the Publicker Commercial Alcohol Co. and the Continental Distilling Corp. The trip was arranged through the courtesy of Mr. Carl Haner, vice-president of the Publicker Commercial Alcohol Co.

The December meeting was held in the Board Room of the Engineers' Club, 1317 Spruce Street, Philadelphia, Pa., on Tuesday, December 4, 1934, at 8:00 P. M. Mr. Stoertz presided. The minutes of the October meeting as read by the Secretary were approved. The Chairman read excerpts from the minutes of the 116th meeting of the National Council, which had been held on November 15, 1934, in New York City. Mr. Jones reported on the work of the Program Committee and stated that the subject of licensing the chemist would be discussed at the next meeting (January 8, 1935). Mr. Harrison agreed to lead the discussion at that meeting.

Mr. Cayo discussed the work of the Technical Service Committee and its problems. This Committee has earned $1,200.00 in fees for placing unemployed technical men. Mr. Chapin suggested that questionnaires be sent to each member on the question of employment, the purpose being to secure complete information for the Technical Service Committee. Mr. Cayo stated that such a questionnaire would be printed

by the local section of the American Chemical Society in the next issue of the *Catalyst*. Since most members of the Institute are members of the A. C. S., it would only be necessary to send copies of the *Catalyst* to those members who are not members of the A. C. S.

The topic of the evening was "The Chemist in Relation to the Consumer." This subject was very ably and adequately covered by Mr. Cayo and Dr. Trumper, and led to a very interesting discussion in which every person present took part. Mr. Cayo suggested that the Institute take an active part in the work of such organizations as Consumers Research. Mr. Harrison pointed out that such a course would be inadvisable as many members were employed by manufacturers and distributors. The conclusion of the evening's discussion was that no matter whether the chemist is "on the consumer's side" or "on the manufacturing or distributing side," he should adhere to a strict policy of truth in his reports, and that one of his aims should be to temper or tone-down the ballyhoo of modern "scientific" advertising, so much of which is misleading to the consumer.

New York Chapter

At the December meeting of the New York Chapter, Professor A. A. Benedetti-Pichler, Professor J. B. Niederl, and Dr. H. K. Alber delighted the members by a truly delightful demonstration of micro-methods of chemical analysis. By means of the stereopticon, the manipulation of almost infinitely small quantities of materials was dramatically portrayed. After a vote of thanks to these wizards from New York University, the meeting adjourned.

Institute Activities as Translated from the Minutes

By Florence E. Wall, F.A.I.C.

THE November Council meeting was devoted to considerably "more of the same;" that is, there was no special business, but routine matters, which can take a surprising amount of time. This occasion marked the first appearance of Dr. Lloyd Van Doren as the recently elected Chapter Representative from New York. Dr. Baker, who was elected last spring to a three-year term as National Councilor as well as to the post of local representative, withdrew from the latter, and Dr. Van Doren takes his place.

The purpose of these Chapter representatives should be clearly understood, but occasionally there has been doubt expressed as to their proper function. Your local representative is supposed to function as the liaison person between a local chapter and the National Council. He should report to the Council each month on the activities of his local chapter, present the special problems of his group which require the consideration of the national body, and report in turn to the next local meeting on whatever was transacted at the council

meeting which might be of special interest to his chapter.

Incidentally, if your local representative does not report to the national meeting, a written report should be sent to the Secretary or we lose a link in what is going on, and you may feel neglected or abused because you have no word of the doings of the council. Each representative receives a copy of the minutes of the council meeting, from which he may make a report at his next local meeting, according to his best judgment.

There was the usual discussion about ways and means of increasing the membership, and reports from members of the general committee. They will have a special meeting before the next council meeting, and we hope for a definite plan of action.

A suggestion was made that members convert their good-will into ultimate benefit by enrolling new members. Membership in the Institute offers an opportunity to serve the profession of chemistry. No other organization gives this, or claims to be interested in it.

Discussion of the insignia and the students' medals goes on apace. We really should like to have some bright ideas on a suitable design. Please send your suggestions to Mr. Neiman, to pass on to the proper committee; but if your design is particularly cryptic or involves a lot of symbolism and explanation, please do not forget to send a glossary with it. We are interested to see what we can evolve which will symbolize the profession without making use of the worn-out symbols of the science.

Your Editor wants news about what you are doing, wherever you are. Each issue of THE CHEMIST should carry a brief account of the business of the latest local meetings; for publication under "Chapter Activities," as well as a story account, or the original paper on the evening's program. If this is kept in mind in planning programs, and the addresses are kept within the range of professional rather than scientific topics, every reader of THE CHEMIST can benefit by what goes on in each local chapter meeting.

New Members

RAYMOND E. KIRK, Ph.D., F.A.I.C., is Head of the Department of Chemistry of the Polytechnic Institute of Brooklyn. He has received degrees from the University of Nebraska, Iowa State College, and Cornell. His specialties are inorganic chemistry, propellants, and explosives, and nitrogen chemistry, and he has published many articles in these fields. He holds the rank of Major, Ordnance Department Reserve, U. S. A., is a councilor of the New York Section of the American Chemical Society, and a member of the editorial board of *Inorganic Syntheses*.

JOHN GODDARD WRIGHT, A.M., A.A.I.C., is a research assistant with the Geigy Company. He holds degrees from Harvard and Cornell and has specialized in the study of nitrogen compounds, spectroscopy, and electrochemistry.

NEWS

A joint meeting of the New York Section of the American Chemical Society (in charge), the Society of Chemical Industry, Electrochemical Society, and Société de Chimie Industrielle, was held February 8th, 7:30 P. M., at The Chemists' Club. Frank C. Whitmore, Dean, School of Chemistry and Physics, Pennsylvania State College, introduced the speaker of the evening, M. R. Fenske, Associate Professor, in charge of Petroleum Refining Laboratory of Pennsylvania State College, who talked on "Recent Developments in Petroleum." The discussion was led by Per K. Frolich, Director of Research, Standard Oil Development Laboratories. Arthur W. Hixson, F.A.I.C., presided.

A meeting of the North Jersey Section of the American Chemical Society will be held at the Winfield Scott Hotel, Elizabeth, N. J., on February 11th. Willis Gibbons, Director of Development of the General Laboratories of the United States Rubber Co., will talk on "Some Industrial Applications of Rubber Latex."

The discovery of the chemical structure of Vitamin B by Robert R. Williams, Research Associate in the Department of Chemistry at Columbia University, was recently announced. Institute members will recall Mr. Williams' talk before the New York Chapter, November 14, 1930, on the "Chemist's Contribution to Telephony." He is chemical director of the Bell Telephone Laboratories, and a research associate of Carnegie Institute. He recommends a thorough grounding in analytical methods in the training of chemists as well as the stressing of pure chemistry rather than chemical engineering.

SOME RECENT PUBLICATIONS BY MEMBERS

Industrial and Engineering Chemistry, January, 1935.

GUSTAV EGLOFF (with J. C. Morrell and C. D. Lowry, Jr.), "Inhibitors in Cracked Gasoline. III."

KURT W. FRANKE (with Alvin L. Moxon), "Effect of Certain Salts on Enzyme Activity."

M. C. WHITAKER, "Accomplishments of the Medalist."

The Scientific Monthly, December, 1934.

E. R. WEIDLEIN, "New Industries for Old."

Textile Colorist, January, 1935

CHARLES E. MULLIN, "Dyeing Equipment."

Chemical Industries, December, 1934.

CHARLES W. RIVISE, "What Is the Scope of a Chemical Invention?"

The award of two gold medals, one to the Reverend Father Julius A. Nieuwland of Notre Dame University, for the discovery of a process for making synthetic rubber; and the other to Dr. Carl D. Anderson of the California Institute of Technology, for the discovery of the positron, a new fundamental unit of matter, is announced by The American Institute of the City of New York. Presentation of the medals will take place at the annual dinner of the American Institute to be held in the Hotel Astor, February 7th.

The Society of Chemical Industry announces a meeting on March 8th. The speaker will be Dr. Stephen P. Burke, who will present a paper on "The Combustion of Coal as a Problem in Chemical Engineering."

M. L. Crossley, F.A.I.C., spoke on "Science in Relation to Social Growth and Economic Development" at the December 14th meeting of the American Institute of the City of New York.

Francis P. Garvan and Charles H. Herty, F.A.I.C., were recipients of bronze plaques presented by the Synthetic Organic Chemical Manufacturers' Association at a dinner on December 6th.

Alexander Silverman, F.A.I.C., talked before Section C of The American Association for the Advancement of Science at Pittsburgh, Pa., December 27th, on "The Prerequisite and Collateral Value of Chemistry."

J. F. X. Harold, F.A.I.C., was recently elected a Councilor of The American Association of Textile Chemists and Colorists.

The Perkin Medal of the Society of Chemical Industry was presented to George O. Curme, Jr., vice-president of the Carbide and Carbon Chemicals Corp., at a joint meeting of the local Chemical Societies held on January 11th. E. R. Weidlein, F.A.I.C., spoke on the medalist. The medal was presented by Marston T. Bogert, F.A.I.C.

Francis P. Garvan of The Chemical Foundation spoke on the retention of tariff rates on dyes and fine chemicals before the Commitee for Reciprocity Information in Washington, December 7th.

New Applications for Membership

FELLOW

THEODORE R. MILNE, *Research Chemist*, Du Pont Rayon Co., Station B, Buffalo, N. Y.

JUNIORS

MICHAEL RUSSO, *Research Chemist*, N. Y. Quinine and Chemical Works, 99 N. 11th St., Brooklyn, N. Y.

ARTHUR PHILIP DEMARCO, 700 No. 40th St., Philadelphia, Pa.

APPLICATION TO BE RAISED FROM STUDENT MEMBER TO JUNIOR

JOHN AUGUST RIEGER, *Laboratory Assistant*, American Sugar Refining Co., Key Highway East, Baltimore, Md.

The Committee on Unemployment and Relief for Chemists and Chemical Engineers reports that the employment situation is better among chemists who have had experience; but that there is little improvement with regard to the older men or the recent graduates. This employment increase, however, consists mainly of positions paying low salaries.

Foster D. Snell, Inc., has been broadcasting a program, "Science in Your Home," over station WOR since the first of September. Interest in the program has been such that plans are to continue it indefinitely.

New York University announces that advanced extension courses in the arts and sciences will be given beginning February 6 to 19, 1935. A detailed bulletin may be obtained by addressing the Director of Evening Study at that University.

The University of Cincinnati announces a series of ten talks on "Applications of the Physical Sciences" to be given Saturday mornings, January 26th to March 30th before an audience of the highest ranking students in local high school classes of physics, chemistry, and advanced mathematics. These talks will be given by professors from the science faculty of the University.

Chemist Wanted

Wanted: Research Chemist with Ph.D. degree or equivalent training, with sound experience in dyestuff chemistry, particularly the chemistry of vat dyes. Address, with full particulars, Box 4111, THE CHEMIST, 233 Broadway, New York City.

Position Open

Wanted: Chemist experienced in pharmaceutical research. One with Ph.D. degree preferred. Address, giving complete information concerning training, experience, and references, Box 4112, THE CHEMIST, 233 Broadway, New York City.

Microscope Wanted

A quotation is desired on a used comparison microscope. Address Box 4113, THE CHEMIST, 233 Broadway, New York City.

U. S. Civil Service Examinations

Applications for positions of associate, assistant, and junior bacteriologist, Food and Drug Administration, must be filed with the U. S. Civil Service Commission, Washington, D. C., by March 11, 1935. Salaries: $3,200 to $3,700 a year for associate grade; $2,600 to $3,100 for assistant grade; and $2,000 to $2,500 for junior grade. The optional subjects for the associate and assistant grades are (1) general, (2) food products, and (3) soils. The specialty represented in connection with the junior grade is food products. Information may be obtained from the Commission or at local post-office or custom-house.

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1. S.G. Barker, Wool Quality, P-209-223—also Lit. Cited P-284-328, His Majesty's Stationery Office, London.
2. Consult Journal of Research, Nat. Bur. Standards, Vol. 13, No. 5 (Nov. 1934).

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